

Notice of Allowability**Application No.**

09/538,941

Examiner

Rip A. Lee

Applicant(s)

LUGINSLAND, HANS-DETLEF

Art Unit

1713

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. This communication is responsive to April 16, 2004.
2. The allowed claim(s) is/are 1,3-5 and 7-20.
3. The drawings filed on _____ are accepted by the Examiner.
4. Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) All b) Some* c) None of the:
 1. Certified copies of the priority documents have been received.
 2. Certified copies of the priority documents have been received in Application No. _____.
 3. Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
6. CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
(a) including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
1) hereto or 2) to Paper No./Mail Date _____.
(b) including changes required by the attached Examiner's Amendment / Comment or in the Office action of
Paper No./Mail Date _____.
7. DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. Notice of References Cited (PTO-892)
2. Notice of Draftsperson's Patent Drawing Review (PTO-948)
3. Information Disclosure Statements (PTO-1449 or PTO/SB/08),
Paper No./Mail Date _____
4. Examiner's Comment Regarding Requirement for Deposit
of Biological Material
5. Notice of Informal Patent Application (PTO-152)
6. Interview Summary (PTO-413),
Paper No./Mail Date _____.
7. Examiner's Amendment/Comment
8. Examiner's Statement of Reasons for Allowance
9. Other _____.

DETAILED ACTION

This office action follows a response filed April 16, 2004. Applicants have amended claims 1, 4, 8, 10, and 15.

EXAMINER'S AMENDMENT

An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with Jeff Towns on June 17, 2004.

Claim 4

- line 2 insert "a mixture of"
- line 7 delete "and which comprises a"
- line 8 delete "mixture of organosilanepoly-sulfane"
- line 8 insert "an" between the words "and" and "organoalkylsilane"

Examiner's note: The current amendment of claim 4 differs from the proposal discussed during the telephone interview. This version is deemed to be more succinct and to contain improved diction without changing the scope of the claim.

Claim 5

page 2, line 1 insert “organosilane is an” at the end of the line after the word “the”

page 2, line 2 delete “is a silane”

page 3, line 1 delete “R¹ = ethoxy, R² = R³ = methyl,”

page 3, line 1 replace “and” with a comma “ , ” as shown by examiner’s edit marks

page 3, line 2 replace “where” with “and”

Claim 15

line 1 insert “polymerized” after the word “solution”

line 1 delete the slash “ / ” mark with a hyphen “ - ” as shown by examiner’s edit marks

Allowable Subject Matter

The following is an examiner's statement of reasons for allowance: Claims 1, 3-5, and 7-20 are allowed over the closest references, U.S. Patent No. 5,834,536 to Scholl and U.S. Patent No. 5,489,701 to Childress *et al.*

The present invention is drawn to a rubber mixture comprising a solution polymerized styrene-butadiene copolymer and organosilanes of general formula $R^1R^2R^3Si-Z-R^4-Z$ in which $R^1 = OEt$, $R^2 = R^3 = Me$, $R^4 = C_{3-18}$ divalent hydrocarbon, and $Z = H$, SCN , SH or $S_x-R^4-SiR^1R^2R^3$, and $x = 2$ to 10 . In another aspect of the invention, the rubber mixture further comprises silicic acid filler and organoalkylsilane. The salient feature of the invention is use of a silane coupling agent which contains less than three alkoxy groups bound to silicon. According to the inventors, this should minimize alcohol elimination during processing which would lead to undesired blistering in the rubber product. Applicants have discovered that the title organosilane coupling agents unexpectedly give rise to reduced rolling resistance ($\tan \delta (60^{\circ}C)$) without impairing other properties.

Scholl teaches rubber compositions comprised of styrene-butadiene copolymer, filler such as silicic acid, natural and synthetic silicates, carbon black, and aluminum oxide, and organosilane compounds. The compound 3-chloropropyldimethylethoxysilane is exemplary. Although the requisite ethoxydimethyl group is present, the compound does not possess structural features consistent with Z as defined in the present claims. Since the reference is directed to use of halogen bearing organosilanes, one having ordinary skill in the art would not have found it obvious to modify the prior art to arrive at the present invention.

The Childress *et al.* patent relates to a general method for synthesizing a series of organosilane polysulfanes for use in low rolling resistance tires. Among an extensive listing of products, one finds the compounds, 3,3'-*bis*(dimethylethoxysilylpropyl) tetrasulfide and 4,4'-*bis*(dimethylethoxysilylpropyl)tetra-sulfide. Compounds containing a tetrasulfide bridge are shown throughout the reference; therefore, one having ordinary skill in the art would have found it obvious to make the compounds, 3,3'-*bis*(dimethylethoxysilylpropyl)tetrasulfide and 4,4'-*bis*(dimethylethoxysilylpropyl)tetrasulfide. Although the compounds satisfy the structural parameters recited in the present claims, it is maintained that the skilled artisan would not have found it obvious to select these two particular compounds from the extensive listing of compounds. Even if these compounds were culled from the general pool of candidates, the combination with solution polymerized styrene-butadiene copolymer is less obvious in view of the fact that the base rubber is not taught in Childress *et al.*

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Prior Art

The prior art made of record but not relied upon is considered pertinent to the Applicant's disclosure. The following references have been cited to show the state of the art with respect to organosilaneplysulfanes containing less than three alkoxy groups per silicon atom.

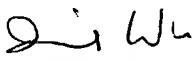
U.S. Patent No. 5,399,739 to French *et al.*

U.S. Patent No. 4,129,585 to Buder *et al.*

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Rip A. Lee whose telephone number is (571)272-1104. The examiner can be reached on Monday through Friday from 9:00 AM - 5:00 PM. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Wu, can be reached at (571)272-1114. The fax phone number for the organization where this application or proceeding is assigned is (703)872-9306.

ral

June 17, 2004


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